

Listing of the Claims

1. (Previously Presented) A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups; and

distributing said coded quadtree coefficient groups among said multiple channels for transmission, said distributing operation including assigning said coded quadtree coefficient groups to said multiple channels such that contiguous portions of said frame data will be transmitted over different ones of said multiple channels.

Claim 2 (Canceled).

3. (Original) A method as claimed in claim 1 wherein:
said generating operation generates said frame data and motion vectors; and

said method further comprises:

forming blocks of said motion vectors;

separately coding said blocks to form coded motion vector blocks; and

distributing said coded motion vector blocks among said multiple channels for transmission.

4. (Original) A method as claimed in claim 3 utilizing a Huffman coding algorithm to obtain said coded motion vector blocks.

5. (Previously Presented) A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data and motion vectors representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups;

forming blocks of said motion vectors;

separately coding said blocks to form coded motion vector blocks;

distributing said coded quadtree coefficient groups and said coded motion vector blocks among said multiple channels for transmission; and

assigning said coded motion vector blocks to said multiple channels such that adjacent portions of said motion vectors will be transmitted over different ones of said multiple channels.

6. (Previously Presented) A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

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for each of said video frames, generating frame data and motion vectors representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups;

forming blocks of said motion vectors;

separately coding said blocks to form coded motion vector blocks; and

distributing said coded quadtree coefficient groups and said coded motion vector blocks among said multiple channels for transmission, wherein said coded quadtree coefficient groups are distributed among said multiple channels independent from said coded motion vector blocks.

7. (Original) A method as claimed in claim 1 further comprising forming said quadtrees into 16 x 16 coding blocks prior to said coding operation.

8. (Original) A method as claimed in claim 1 wherein: said transforming operation comprises performing a wavelet transform such that said transform coefficients are wavelet coefficients; and

said coding operation comprises utilizing a zerotree wavelet coding algorithm.

9. (Original) A method as claimed in claim 1 wherein said coding operation comprises:

assembling said coded quadtree coefficient groups into packets;

for each of said packets, assigning one of said multiple channels for transmission of said each packet; and

forwarding said each packet toward said assigned one of said multiple channels.

10. (Original) A method as claimed in claim 1 further comprising:

assembling said coded quadtree coefficient groups into packets;

attaching a packet identifier to each of said packets prior to said distributing operation;

receiving said packets at a decoder via said multiple channels; and

reconstructing said each video frame at said decoder from said received packets in response to said packet identifier.

11. (Previously Presented) A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups;

assembling said coded quadtree coefficient groups into packets;

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attaching a packet identifier to each of said packets prior to said distributing operation;

distributing said packets of said coded quadtree coefficient groups among said multiple channels for transmission;

receiving said packets at a decoder via said multiple channels; and

reconstructing said each video frame at said decoder from said received packets in response to said packet identifier, said reconstructing operation including:

determining an unsuccessful transmission of one of said packets; and

forming an estimate of said transform coefficients of said one of said packets in response to adjacent ones of said transform coefficients of others of said packets received via others of said multiple channels.

12. (Previously Presented) A method of facilitating transmission of video frames over multiple channels in a communication system, said method comprising:

for each of said video frames, generating frame data and motion vectors representative of said each video frame;

transforming said frame data to obtain transform coefficients of said frame data;

assembling quadtrees of said transform coefficients, each of said quadtrees including a group of said transform coefficients associated with an equivalent spatial location in said each video frame;

separately coding said quadtrees to form coded quadtree coefficient groups;

assembling said coded quadtree coefficient groups into first packets;

attaching a first packet identifier to each of said first packets prior to said distributing operation;

forming blocks of said motion vectors;

separately coding said blocks to form coded motion vector blocks;

assembling said coded motion vector blocks into second packets;

attaching a second packet identifier to each of said second packets;

distributing said first packets and said second packets among said multiple channels for transmission;

receiving said first packets and said second packets at said decoder via said multiple channels; and

reconstructing said each video frame from said first and second packets in response to said first and second packet identifiers.

13. (Original) A method as claimed in claim 12 further comprising:

determining an unsuccessful transmission of one of said second packets; and

estimating said motion vectors of said one of said second packets from an average of surrounding ones of said motion vectors of others of said second packets received via others of said multiple channels.

14. (Original) A method as claimed in claim 10 wherein said reconstructing operation comprises adaptively buffering said received packets.

15. (Original) A method as claimed in claim 1 wherein said communication system is a satellite-based communication network and said multiple channels are wireless voice channels managed by said satellite-based communication network.

Claims 16-23 (Canceled).

24. (Previously Presented) A system for facilitating transmission of video frames over multiple channels in a communication network, said system comprising:

an input for receiving each of said video frames;

a processor in communication with said input for generating frame data representative of said each video frame;

a wavelet transformer in communication with said processor for transforming said frame data to obtain wavelet coefficients of said frame data;

a quadtree-based compressor for receiving said wavelet coefficients and assembling quadtrees of said wavelet coefficients, each of said quadtrees including a group of wavelet coefficients associated with an equivalent spatial location in said each video frame;

a coder for separately coding said quadtrees to form coded quadtree coefficient groups; and

an output interface in communication with said coder for receiving said coded quadtree coefficient groups, said output interface assigning said coded quadtree coefficient groups to said multiple channels such that adjacent portions of said frame data will be transmitted over different ones of said multiple channels;

an input interface for receiving transmitted packets of coded quadtree coefficient groups from a second system via said multiple channels;

buffer elements in communication with said input interface, one each of said buffer elements being associated with one each of said multiple channels, said input interface forwarding said transmitted coded quadtree coefficient groups received at ones of said multiple channels toward said buffer elements associated with said ones of said multiple channels;

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a decoder in communication with said buffer elements for receiving said transmitted coded quadtree coefficient groups and reconstructing second video frames represented by said transmitted coded quadtree coefficient groups; and

an estimator in communication with said decoder, wherein upon determination of an unsuccessful transmission of one of said packets, said estimator forms an estimate of said transmitted coded quadtree coefficient groups of said one of said packets in response to adjacent ones of said transmitted quadtree coefficient groups of others of said packets received via said multiple channels.

25. (Previously Presented) A system for facilitating transmission of video frames over multiple channels in a communication network, said system comprising:

an input for receiving each of said video frames;

a processor in communication with said input for generating frame data representative of said each video frame;

a wavelet transformer in communication with said processor for transforming said frame data to obtain wavelet coefficients of said frame data;

a quadtree-based compressor for receiving said wavelet coefficients and assembling quadtrees of said wavelet coefficients, each of said quadtrees including a group of wavelet coefficients associated with an equivalent spatial location in said each video frame;

a coder for separately coding said quadtrees to form coded quadtree coefficient groups; and

an output interface in communication with said coder for receiving said coded quadtree coefficient groups, said output interface assigning said coded quadtree coefficient groups to said multiple channels such that adjacent portions of said frame

data will be transmitted over different ones of said multiple channels;

an input interface for receiving transmitted first packets of coded quadtree coefficient groups and second packets of motion vector blocks from a second system via said multiple channels;

buffer elements in communication with said input interface, one each of said buffer elements being associated with one each of said multiple channels, said input interface forwarding said transmitted coded quadtree coefficient groups received at ones of said multiple channels toward said buffer elements associated with said ones of said multiple channels; and

a decoder in communication with said buffer elements for receiving said first and second packets and reconstructing said second video frames from said first and second packets.

26. (Previously Presented) A system as claimed in claim 25 further comprising an estimator in communication with said decoder, wherein upon determination of an unsuccessful transmission of one of said second packets, said estimator forms an estimate of said motion vector blocks of said one of said second packets from an average of surrounding ones of said motion vectors of others of said second packets received via said multiple channels.

Claims 27-31 (Canceled).